(19) World Intellectual Property **Organization**

International Bureau



(43) International Publication Date 10 November 2005 (10.11.2005)

PCT

(10) International Publication Number WO 2005/104680 A2

Not classified (51) International Patent Classification:

(21) International Application Number:

PCT/US2005/011711

6 April 2005 (06.04.2005) (22) International Filing Date:

English (25) Filing Language:

English (26) Publication Language:

(30) Priority Data:

10/709,113 14 April 2004 (14.04.2004) US

- (71) Applicant (for all designated States except US): INTER-NATIONAL BUSINESS MACHINES CORPORA-TION [US/US]; New Orchard Road, Armonk, NJ 10504 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): GEISS, Peter, J. [US/US]; 601 Poker Hill Road, Underhill, VT 05489 (US). JOSEPH, Alvin, J. [IN/US]; 109 Coyote Lane, Williston, VT 05495 (US). LIU, Qzhi [CN/US]; 124 Sandhill Road, #3, Essex Junction, VT 05452 (US). ORNER, Bradley, A. [US/US]; 539 North Harbor Road, Colchester, VT 05446 (US).
- (74) Agent: CANALE, Anthony, J.; International Business Machines Corporation, Intellectual Property Law--Zip 972E, 1000 River Street, Essex Junction, VT 05452 (US).

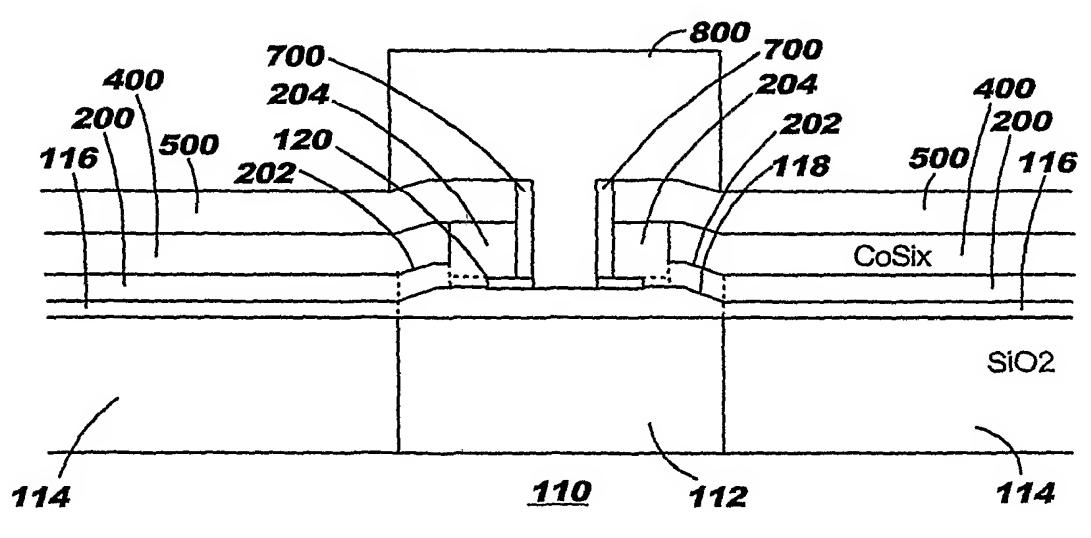
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY,

[Continued on next page]

(54) Title: A METHOD OF BASE FORMATION IN A BICMOS PROCESS



(57) Abstract: Disclosed is a bipolar complementary metal oxide semiconductor (BiCMOS) or NPN/PNP device that has a collector (112), an intrinsic base (118) above the collector, shallow trench isolation regions (114) adjacent the collector, a raised extrinsic base (202) above the intrinsic base, a T-shaped emitter (800) above the extrinsic base, spacers (700) adjacent the emitter, and a silicide (400) layer that is separated from the emitter by the spacers.



WO 2005/104680 A2



TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

— as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations

- of inventorship (Rule 4.17(iv)) for US only

Published:

— without international search report and to be republished upon receipt of that report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.